

What is claimed is:

1. A voltage detecting apparatus for a combination battery comprising:

5        a multiplexer type flying capacitor voltage detecting circuit having an input multiplexer and an output side sampling switch, whose operation timing is controlled in response to an entered switching control signal for time sequentially executing voltage read-in processing and voltage read-out processing to detect the voltage of a plurality of battery modules of a combination battery in a time sequential fashion;

10        a synchronous control type A/D converter whose operation timing is controlled in response to an entered activation signal for sample holding and A/D converting an analog output voltage of said flying capacitor voltage detecting circuit, and holding a digital voltage signal as a resulting output until a succeeding digital voltage signal is obtained; and

15        a battery controller whose operation timing is controlled in response to an entered transfer command signal for reading said digital voltage signal produced from said A/D converter and storing the readout digital voltage signal into a data storage area assigned to each of said battery modules,

20        wherein said battery controller comprises a timing table on which generation timings of said switching control signal, said activation signal, and said transfer command signal are all determined on a common time axis, and

25        timing control for said flying capacitor voltage detecting circuit, said A/D converter, and said battery controller is carried out by outputting said switching control signal, said activation signal, and said transfer command signal to said flying capacitor voltage detecting circuit, said A/D converter, and said battery controller at the timing regulated in said timing table and according to an order memorized in said timing table.

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2. The voltage detecting apparatus for a combination battery in accordance with claim 1, wherein said battery controller gives first priority to the output of said switching control signal supplied to said flying capacitor voltage detecting circuit in a case that said timing table regulates  
5 signal generation timings in such a manner that the generation timing of said switching control signal equals to or overlaps with the generation timing of said activation signal or said transfer command signal.

3. The voltage detecting apparatus for a combination battery in  
10 accordance with claim 1, wherein

said timing table sets the timing of said activation signal in such a manner that a voltage read-in timing of said A/D converter does not involve a switching timing of said flying capacitor voltage detecting circuit and a switching timing for data storage of said battery controller.

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4. The voltage detecting apparatus for a combination battery in accordance with claim 1, wherein

said timing table includes a first small table for designating the timing of said switching control signal and a second small table for  
20 designating the timing of said activation signal and said transfer command signal, being respectively regulated on the common time axis, and

said battery controller refers to said first small table at time intervals shorter than those of said second small table.

25 5. A voltage detecting apparatus for a combination battery, comprising

a flying capacitor voltage detecting circuit having an input multiplexer and an output side sampling switch and executing voltage read-in processing and voltage read-out processing in a time sequential  
30 fashion to detect the voltage of a plurality of battery modules of a

combination battery;

an A/D converter for A/D converting an analog output voltage of said flying capacitor voltage detecting circuit into a digital voltage signal; and

5           a battery controller for reading said digital voltage signal produced from said A/D converter and storing the readout digital voltage signal into a data storage area assigned to each of said battery modules,

wherein said battery controller comprises a read-out order memory table for regulating voltage detection order of respective battery modules,

10           said battery controller writes identification numbers of battery modules into said read-out order memory table in order of voltage largeness of respective modules detected previously, and

          said battery controller controls said input multiplexer of said flying capacitor voltage detecting circuit in such a manner that, in the next voltage  
15 read-out processing of respective modules, the module voltages are successively read out in accordance with the order memorized in said read-out order memory table.

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